

## **Remarks**

Various claims under consideration have been amended in an effort to overcome the Examiner's rejection under 35 U.S.C. § 112, second paragraph, as discussed below. No substantive change is intended.

### **Restriction Requirement**

The Examiner has reiterated his restriction requirement and has requires that applicants' reaffirm their provisional election of Group I (claims 1-10, 24-26 and 34-36) for prosecution on the merits. Accordingly, applicants hereby reaffirm their provisional election of Group I for prosecution on the merits

### **Rejection under 35 U.S.C. § 112**

Claims 1-10, 24-26 and 34-26 stand rejected under 35 U.S.C. § 112, second paragraph.

The Examiner has questioned the antecedent basis for "the number of tasks" and "said queue" in the first subparagraph, as well as "a queue" in the second subparagraph, of claims 1, 24 and 24. Applicants have amended "the number of tasks" to read "a count of tasks" and have amended "said queue" (here and elsewhere in the claims under consideration) and "a queue" to read "said message queue". Accordingly, this ground for rejection is believed to be overcome.

### **Rejection under 35 U.S.C. § 103**

Claims 1-10, 24-26 and 34-34 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Lumetta et al., "Managing Concurrent Access for Shared Memory Active Messages", IEEE, 1998, pages 272-278 (Lumetta), in view of Kessler et al. U.S. Patent 5,841,973 (Kessler) (page 5, ¶ 10). This rejection is respectfully traversed.

In applicants' claimed system, as defined for example in claim 1, a use count is stored for the message queue indicating a count of tasks accessing the queue. A use count flag for the caller is stored indicating whether the caller has acquired a lock on a queue. Atomically with updating the use count, the use count flag is updated to indicate whether the caller has acquired a lock on the queue. This use count may be used for various purposes, such as use count-based responsibility passing where any number of tasks can read various message queue chains, concurrent with queue updates being made (page 5, lines 1-3).

Lumetta discloses various systems for managing concurrent access to concurrent messages. Section 3.1 (pages 274-275) discusses various locking algorithms, including the ticket lock and the Anderson lock (page 275). To obtain a lock in the ticket lock algorithm, a process obtains a ticket and waits for a service counter to show its ticket number. The ticket counter is incremented atomically to ensure that each process receives a different ticket. When a process releases a lock, it increments the service counter to allow the next process waiting on the lock to proceed. The Anderson lock, which is said to improve on the ticket lock, divides the service counter into a separate flag for each process waiting on the lock. The lock operation obtains a slot assignment with a compare and swap (CAS), then waits for the assigned slot to contain a lock indicator. When releasing a lock, a process moves the lock indicator from its slot into the next.

Kessler describes a messaging facility for a multiprocessor computer system. As described at column 8, lines 30-36, a 64-bit message queue control word (MQCW) 70 shown in Fig. 5 contains a 21-bit limit field 72 indicating the number of slots 64 corresponding to individual messages in a message queue 60 (Fig. 4). In one of its uses, the value in the limit field 72 is compared with the value in the adjacent tail field 74 (indicating the location of the tail of the queue) to determine whether the message queue is full and cannot accept another message (col. 11, line 65 to col. 12, line 3).

The Examiner equates Lumetta's ticket counter with applicants' use count and Lumetta's lock indicator with applicants' use count flag. The Examiner asserts in effect that Lumetta discloses applicants' claimed combination except for the function of the use count of indicating a count of tasks accessing the queue. The Examiner asserts that this latter function is provided by the limit

field 72 of Kessler and that it would be obvious in view of Kessler to modify Lumetta accordingly. Applicants respectfully disagree.

In the first place, it is not true the Lumetta discloses applicants' claimed invention except for a use count of indicating a count of tasks accessing the queue. Most notably, the ticket counter does not store a use count indicating a count of tasks accessing the queue (or any other relevant count, for that matter). Rather, it is merely a means for ensuring that each process receives a different ticket (as in a deli, for example). Thus there is no indication that the ticket counter is ever decremented (as for example in claim 3), as one would expect if it truly represented a use count.

Nor does Kessler teach modifying Lumetta as suggested by the Examiner to provide a use count of indicating a count of tasks accessing the queue. It is apparent from the above description that the limit field 72 is not a "use count" for a message queue indicating a count of tasks accessing the queue, as asserted by the Examiner. While the value of the limit field 72 can be changed, it merely specifies the maximum size of the queue 60 in terms of the number of messages. The limit field 72 does not indicate the actual size of the queue 60 (that is what the tail field 74 does) or a count of tasks accessing the queue. Accordingly, even if the Kessler's teachings were combined with those of Lumetta in the manner suggested by the Examiner, the resulting combination would not duplicate applicants' claimed invention.

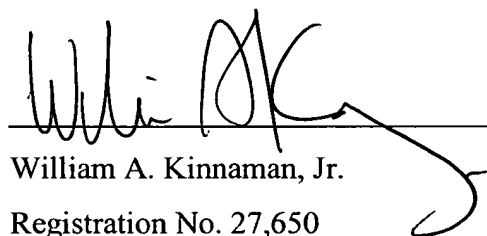
## Conclusion

For the foregoing reasons, claims 1-10, 24-26 and 34-36 as amended are believed to distinguish patentably over the art cited by the Examiner.

Reconsideration of the application as amended is respectfully requested. It is hoped that upon such consideration, the Examiner will hold all claims allowable and pass the case to issue at an early date. Such action is earnestly solicited.

Respectfully submitted,  
DONALD F. AULT et al.

By

A handwritten signature in black ink, appearing to read 'William A. Kinnaman, Jr.', is written over a horizontal line. The signature is stylized with a large 'W' and 'K'.

William A. Kinnaman, Jr.

Registration No. 27,650

Phone: (845) 433-1175

Fax: (845) 432-9601

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